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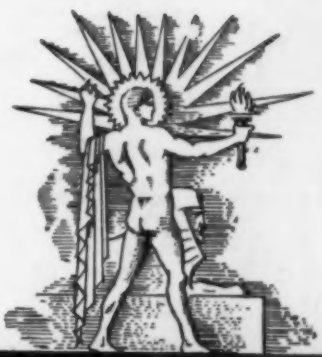
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



August 14, 1937

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A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

Japanese chemists are attempting to make rayon from soy bean husks.

In Java a bridegroom who cannot come to the wedding ceremony may send his kris—his dagger—to represent him.

Government scientists are crossing northern and southern blueberries to get a plant for the south bearing fine quality fruit.

One thing the country needs is a variety of watermelon to fit the average ice box—plant scientists are trying to produce one.

Entomologists in Kansas have observed bandit beetles in grain fields: the beetles waylay and rob red ants carrying home loads of seed.

Cross-eyed children should have early treatment, says one physician, because the condition affects a child's looks, his morale, and his physical efficiency.

In a study of commercial and home methods of washing five cotton fabrics, it was found that commercial methods weakened fabrics less in the first 15 launderings, but thereafter weakened them more.

Absolutely pure alcohol has no odor.

It is believed that birds can neither smell nor taste their food.

A geography of the Soviet Union in 36 volumes is being prepared.

There are over 50 species of *Sansevieria*, popular house plant sometimes called snake plant.

The New Testament has been translated into the African Nyore dialect spoken by 300,000 natives of Kenya.

A standard distress signal, consisting of three quickly repeated calls or visible signs, has been approved for use in serious emergencies in National Forests.

Two military log bridges found in France are believed to have been built for Caesar's cavalry to cross swampy ground in his second campaign against the Bellovaci.

Not all mentally deficient children owe their condition to heredity, says Dr. D. A. Thom, psychiatrist; about 40 per cent. owe their dullness to various causes "which may arise any time after conception up to the fifth or sixth year of life."

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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MEDICINE—DENTISTRY

Vitamin C Is Suggested As Treatment For Pyorrhea

Link Between Gum Disease and Scurvy Revealed When Symptoms Are Found Correlated With Blood Content

A LINK between pyorrhea and scurvy has been forged at the laboratories of the Harvard Dental School. Drs. Paul Boyle and David Weisberger have under way research which indicates that a lack of vitamin C in the diet may be the cause of—or at least a contributing factor to—pyorrhea just as this vitamin C has long been known to cause scurvy.

While the findings are yet incomplete they indicate, say the scientists, that as far as the general practitioner is concerned vitamin C treatment for pyorrhea "can be adopted with safety and it probably should be adopted as a routine measure in addition to, but not in place of, other recognized forms of therapy."

The Harvard dentists have been working with both animals and humans in their studies. Guinea pigs were fed diets varying in their vitamin C content and later checked to see the degree of pyorrhea which they developed. X-ray and microscopic examinations of these animals showed all the characteristics of true pyorrhea in reproducible form.

Forty-eight human patients were studied in the dental school where their degree of pyorrhea symptoms were compared with the content of vitamin C in their blood. Twenty-three patients with a low vitamin C blood content had marked evidences of the disease. Ten patients with a reduced vitamin C blood content showed the gum disease but to a lesser extent than the first group. Among fifteen patients with normal vitamin C blood content only one case had the disease.

Not Conclusive

These human findings, it is emphasized, are not conclusive but they do offer a most consistently positive finding in cases of the advanced disease, Dr. Weisberger indicated.

To the layman and the average dental practitioner the research has three significant points: (1) The new test of vitamin C in the blood as employed is not practical for a dental office and will probably largely be confined to hospitals. (2) The suggested use of vitamin C is a relatively safe procedure, for most experts agree the body can handle an overdose easily. This is not true with vitamin D. (3) The improvement in the mouth tissues around the teeth, which occurs when vitamin C is administered, indicates the practical value of the treatment.

Vitamin C, found naturally in limes and lemons principally, is also available in tablet form as ascorbic acid or cevitamic acid. To maintain the normal amount of vitamin C in the blood a daily intake of 50 milligrams is sufficient. The suggested dose for treating pyorrhea is a gram in five or six days, or about 150 to 200 milligrams daily.

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LARGEST CHROME-ALUM CRYSTAL?

This huge chrome-alum crystal, 18 inches high and weighing 50 pounds was "grown" from a perfect miscroscopically-selected "seed" during the past three and one-half years by Stanley A. Phillips, of the University of Illinois, who holds another chrome-alum crystal only six weeks old.

ETHNOLOGY

Chinese Civilization Is Not So Ancient As Once Thought

SOME people have claimed that the famed and ancient civilization of China grew and flourished in the isolation that occidental travelers knew when they first went there in comparatively recent times. Others hold that China's civilization and its arts were lifted "ready made" from the Near East civilization of Babylonia and Egypt.

Neither theory has any basis of fact, declared Carl Whiting Bishop of the Freer Gallery of Art, Washington, D. C., in an address before the University of Michigan Institute of Far Eastern Studies.

New knowledge of the last few years is upsetting some long favored conceptions of China and its cultural rise. For one thing Chinese civilization is not one of the oldest in the world, as popularly supposed.

What China truly can claim, said Mr. Bishop, is a longer continuous history than most nations have, which helps lend an air of antiquity really unpossessed.

Actually Babylonia and Egypt were flourishing thousands of years before China. But China has changed so slowly that it has retained, almost into present times, some characteristics which have disappeared from other nations long ago. This, again, lends an air of antiquity to probing modern men.

The early origins of China's civilization, said Mr. Bishop, appear to have arisen in the basin of the great Yellow River, making it another one of the well-known "river-valley civilizations" like those along the Nile, the Indus and Euphrates.

When Babylonia and Egypt had advanced well on the way to organized civilization the Chinese dwelt in a state of barbarism only a little more advanced than those of the American Indians on the Atlantic seaboard at the time of the landing of Columbus, declared Mr. Bishop.

One fact indicating that Chinese civilization was probably not of independent, isolated origin is that few, if any, of the

domestic animals or food plants of either the modern or ancient Chinese were of native origin. Not only did these forms appear in the Near East long before they appeared in China but also there appear to be no wild forms native in China from which they could have come. However, the migration of these foods and plants was accomplished before the beginning of China's historical period.

At the earliest known historical time in China—about the middle of the second millennium B. C.—society was divided there into two great classes; land-holding feudal lords and a great mass of serf population. The former class can be said to have been in the Bronze Age of civilization, while the latter were still, in effect, in the New Stone Age.

Then, about the 11th century B. C. came the invasion of China by the peoples of unknown but probably related origin, the Chou. With this invasion came significant changes that occurred slowly but surely. By 200 B. C., China was finally coming into her Iron Age, said Mr. Bishop.

Autocratic government in China, centered in a single emperor, did not arrive until the third century B. C., Mr. Bishop added. With this important change Chinese civilization took on those characteristics that marked it for the next two thousand years; or until the impact of sea trade routes led to its collapse.

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ANTHROPOLOGY

Oldest Man Once Lived Where Fighting Now Rages

WHERE modern man's most ancient ancestors known to science lived, loved, worked and fought, Japanese and Chinese soldiers are now using the most modern methods of killing each other. Reports from the Peiping area indicate that the famous archaeological sites near Chou-kou-tien are well within the battle zone. Here have been unearthed from caves the bones of Sinanthropus, the Peking Man, who lived perhaps half a million years ago and who is considered to be perhaps the most ancient ancestor of modern man.

Chou-kou-tein is only 45 miles from Peiping on a branch of the Peiping-Hankow Railway. Scientists here are concerned that the present fighting will endanger the collections and studies of the geologists and anthropologists engaged in studying Peking Man, as well as other scientific work in the Peiping area.

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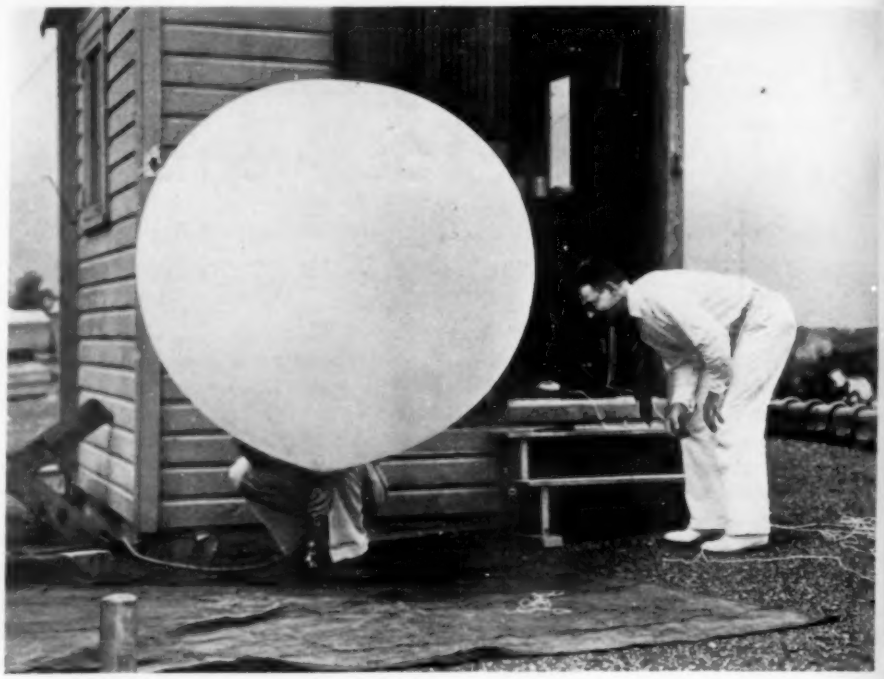

BALLOON

Dr. L. F. Curtiss, National Bureau of Standards scientist, oversees the inflation of one of the small robot balloons which bear aloft radio transmitting equipment that helps science probe the upper air secrets of weather and cosmic rays. Recently Dr. Curtiss sent up a balloon which reached an altitude of 17 miles and then fell at a speed of 150 miles an hour. At 8,000 altitude it was seen by . . . (See next page)

PHYSICS—AERONAUTICS

Cosmic Ray Radio Balloon Followed by Plane to Ground

A STAR fell on tobacco row at a farm near the little town of Aquasco, Md., some 30 miles from Washington. Moreover an airplane chased the star to earth. Or at least that is what Franklyn Irvin Gibbons thought as he stopped hoeing his tobacco recently and watched a plane following a shining object coming down from the sky into his nearby cornfield.

The "star" was a radio balloon sent aloft by Dr. L. F. Curtiss of the National Bureau of Standards, which ascended some 17 miles and transmitted, back to earth, cosmic ray data. The zooming airplane was from the U. S. Naval Air Station, flown by W. B. Fuller, radioman first class, and O. T. Cooper, chief radioman. They noted the shining bag of the radio balloon falling at the rate of about 150 miles an hour at an altitude of 8,000 feet and dove to follow it to its landing. The coincidence is the first ever known to occur in the new field of radio meteorography by which scientists are now probing the upper air to learn its weather and cosmic ray secrets.

Tiny radio transmitting sets carried aloft in small, unmanned balloons are reaching far beyond the limits of human flight in either airplanes or balloons. The particular "star" which farmer Gibbons recovered had gone up nearly 90,000 feet. Other and similar instruments sent up by Dr. Curtiss have reached altitudes of 25 miles or about 132,000 feet.

Tobacco-hoeing Mr. Gibbons thus described the landing for Science Service:

"It sure fell fast and I ran down the valley and around the woods after it. That airplane was so close that it scared the children. It carried two men; I could see them, it was so close. The balloon stopped in the cornfield just two corn

rows from the woods. You sure was lucky it didn't go farther."

The Navy plane overhead circled the farm until farmer Gibbons could be seen clearing a barbed wire fence with the balloon and its precious instrument held high over his head and approaching his home. Then the Navy pilots started to figure out where they were.

The little town of Aquasco appeared on the aerial maps they carried and then by noting the color of the roads, concrete, macadam and mud, and their various turns the pilots believed they could return to the farm by motor.

Quickly they raced back to the Naval Air station and soon were at the Gibbons farm, where Mr. Gibbons said:

"It's all right except for the balloon part. I tied it to a post near the chicken yard there and it went off like a cannon. You should have seen those chickens go—under the house, behind the barn and everywhere. I'm sure sorry they're taking it away, 'cause the kids can't play with it any more."

The playing, it should be explained, consisted of taking power from the tiny 135-volt battery in the device and hooking it on to a small motor designed to be powered by 1.5 volts.

Dr. Curtis, receiving the instrument, declared it was in the best condition of all the 12 similar radio balloons which he had released. Eight of them have now been recovered, but none so close to Washington. Some of the balloons have been returned from the state of Delaware.

Because of the great height to which the balloon ascended and its rapid descent, the chance of its being sighted from an airplane was infinitesimally small, said Dr. Curtiss. He congratulated the Navy flyers on seeing and finding it for him. At the Naval Air Station the feat of spotting the house from the air so that the pilots could later drive right to its door was also commended.

The accompanying pictures show Dr. Curtiss inflating a similar balloon, the Navy flyers who followed it to earth, and Farmer Gibbons holding the "fallen star" of science.

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PUBLIC HEALTH

First Two Weeks Are Hardest; Chicago Wants to Know Why

New Campaign To Reduce Infant Mortality Centers On Newborn; Prematurity and Hemorrhage Responsible

IF a baby lives to be two weeks old he will probably live a long time. But it is tough going for the first fortnight.

Chicago, notable for its health activities for infants, has embarked on a campaign to save the newborn.

The death rate for infants from 7 days to 1 year of age, in the United States registration area, has been reduced 53 per cent. during the years 1916 to 1934 inclusive.

During the same period the death rate for infants under 7 days has been reduced only 10 per cent.

If infant mortality is to be further materially decreased, the chief efforts must go to prevent the deaths that occur during the first few days of life, declares Dr. Herman N. Bundesen, president of the Chicago board of health.

Before such an effort can be successful the causes of early infant deaths must be accurately determined, Dr. Bundesen states.

The Chicago plan, which got under way in January, 1936, is to have autopsies performed by competent pathologists on as many deceased newborn infants as possible.

A protocol covering all the facts uncovered by the autopsy is obtained. An investigation is made by trained workers of the clinical history and available laboratory results.

After consideration of the entire record—clinical, laboratory and pathologic—a conclusion is reached as to the most probable cause of death.

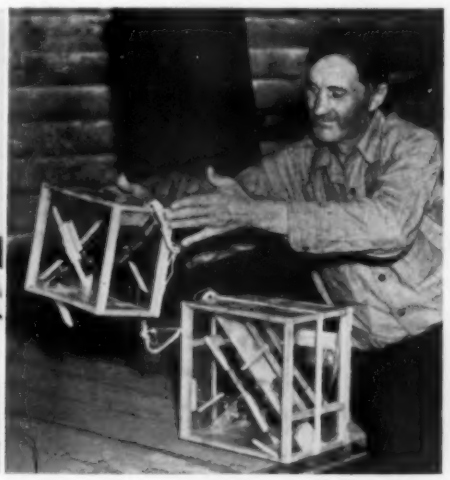
Cerebral hemorrhage and prematurity are the two leading causes of death among newborn babies, Chicago has found. Therefore the chief attack will be centered on these two conditions.

In the *Journal of the American Medical Association,* (July 31) Dr. Bundesen, Dr. William I. Fishbein, Dr. O. A. Dahms and Dr. Edith L. Potter, all of Chicago, discuss the factors responsible for failure further to reduce infant mortality.

Carelessly filled out and incorrect death certificates, and methods of disease classification that emphasize the

SIGHTED

. . . Radioman first class, W. B. Fuller, left, and O. T. Cooper, chief radioman of the U. S. Navy, above, flying a plane from the U. S. Naval Air Station at Washington. The flyers zoomed earthward following the falling balloon and circled until they saw it had landed, to be rescued. Then, spotting the farmhouse where the balloon was taken, they later returned to greet the astonished finder . . .



RECOVERED

. . . Franklyn Irvin Gibbons, Aquasco, Md., tobacco farmer, shown here holding the intricate scientific apparatus, which fell "like a star" in his field. Gibbons tied the balloon to a post in his yard, where it exploded and sent chickens scurrying. Scientist Curtiss reports the instrument was returned in good condition. Says farmer Gibbons: "I'm sure sorry they're taking it away, 'cause the kids can't play with it any more."

secondary and ignore the important and preventable causes of death hinder the reduction of deaths among the newborn, they assert.

They point to the need for further study of the factors responsible for premature births.

At present the principal and most helpful field of endeavor, these doctors declare, is to make certain that the infant is in skilled medical hands.

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CHEMISTRY

Cotton Industry Backward In Applying Chemistry

MOST laymen, and too many textile manufacturers also, think of cotton as a finished fiber that nature has produced, and to which man can do but little more than to spin and weave it into fabric. This lack of realization of what chemistry can do to cotton is a sizable factor in the rise of the synthetic rayon fibers. Rayon came out of the laboratory so that chemical treatment of these man-made fibers has been natural. Not so has been the processing of raw cotton into the newer finishes that attract the eye, lend utility and bring new profits.

Mercerizing cotton, for years, was about the only chemical treatment applied to cotton. But cotton treated with a solution of copper oxide in ammonia yields wool effects. A variation of this treatment gives a permanent lustrous finish approaching that of rayon.

Treating cotton with strong sulphuric acid will give either a linen or a parchment-like finish depending on controlled conditions. Even a measure of transparency can be obtained with sulphuric acid applied at low temperatures.

Dr. Walter M. Scott, textile expert of Gustavus J. Esselen, Inc., Boston consulting chemists also points out that the dyeing properties of cotton can be entirely changed and simultaneously special waterproofing effects produced by treating the cotton fibers so that they are partially converted to esters of cellulose. Ordinary cotton dyes do not "take" on such "immunized" cotton but dyes similar to those used for acetate rayon will.

With a few exceptions, Dr. Scott declares, the cotton industry as a whole is backward about using, to full advantage, the chemical knowledge that could aid it.

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DOCUMENTATION

American Delegation Goes to World Documentation Meet

AMERICAN science, scholarship and libraries will be represented when the World Congress of Documentation convenes in Paris August 16 to discuss how the written and pictorial records of the world can be more efficiently organized.

An official delegation has been appointed by the United States, headed by Watson Davis, director of Science Service and president of the newly-organized American Documentation Institute.

Other members of the delegation include:

Miss Claribel R. Barnett, Librarian, Department of Agriculture; Dr. William Warner Bishop, Librarian, University of Michigan; Rudolph Block (Bruno Lessing) New York City; Dr. Worthington C. Ford, Honorary European Representative of the Library of Congress, Paris; Herman H. Fussler, Microphotographic Laboratory, University of Chicago; Miss M. Alice Matthews, Librarian, Carnegie Endowment for International Peace; Miss Margery Quigley, Librarian, Free Public Library, Montclair, N. J., Miss Sabra M. Vought, Librarian, United States Office of Education; Prof. Douglas Waples, Graduate Library School, University of Chicago.

One of the subjects that will be most widely discussed is the use of microfilms in making available the literature of the world that can not be distributed in any other way because of the cost of printing and other methods of duplication. Microfilms are small photographs of books, manuscripts, photographs, and other material, each page or sheet occupying less than a square inch on what appears to be ordinary motion picture film. The cost of microfilm is only about a cent a page.

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DOCUMENTATION

Scholars Form American Documentation Institute

THE AMERICAN Documentation Institute, organized this year on behalf of some 60 national scholarly, scientific and informational organizations and institutions, is a creation of the intellectual world fashioned to attempt the solution of some of the problems that surround publication, bibliography, library facilities and other phases of documentation in the fields of research, education and learning.

It will give special attention to such new tools in documentation as microphotographic duplication. It will encourage, cooperate with and in some cases operate Bibliofilm Services (services for copying on microfilm) in libraries and elsewhere in order that the world's great store of recorded knowledge may be most easily accessible to those who need to use the literature for research purposes. It will cooperate with existing journals and institutions in publishing through microfilm essential research material that is not required in large editions.

In fields less new the American Documentation Institute will be able to act as an operating agency that can cut across different intellectual fields. Projects under investigation include document preservation, cooperative publishing by offset lithography, etc.

By establishing relations with similar organizations in other countries and through participation in international efforts in documentation, the American Documentation Institute will be able to facilitate world interchange of literature and information.

The documentation activities of Science Service, the institution for the popularization of science, developed during the past two years became a nucleus for the American Documentation Institute. Such a national organization was foreseen as an outcome of Science Service's documentation activities when they were begun in July, 1935, implemented with grants from the Chemical Foundation and conducted with the cooperation of

the U. S. Naval Medical School, the U. S. Department of Agriculture Library, the Bureau of the Census, the Works Progress Administration, the Library of Congress and other agencies.

Organized as a corporation "not for profit" but for educational, literary and scientific purposes, the American Documentation Institute resulted from a meeting attended by delegates from national councils, societies, and other organizations in Washington on March 13.

The officers and board of trustees are: Watson Davis, Science Service, President; Robert C. Binkley, Western Reserve University, Vice-President; Solon J. Buck, National Archives, Treasurer; James Thayer Gerould, Princeton University; Ludvig Hektoen, National Research Council; Anne Shively, Secretary.

The functions of Science Service's Documentation Division were taken over by the American Documentation Institute on July 1. These consist of the Bibliofilm Service, the Auxiliary Publication Service and related activities.

Bibliofilm Service has been operated in the Library of the U. S. Department of Agriculture since November, 1934, and it has copied many thousands of pages of literature on microfilm for research workers. Arrangements have been made to extend Biblofilm Service to the Library of Congress and the Army Medical Library, also in Washington, D. C., in the fall when new microfilm cameras will be available.

The design and development of microphotographic appartus carried on by Science Service with the cooperation of the Chemical Foundation, U. S. Navy, Bureau of the Census, Works Progress Administration, etc., has been largely completed and is now capable of being left in commercial hands. The American Documentation Institute will not engage in the sale and manufacture of apparatus, but will cooperate with all manufacturers and commercial concerns so far as practicable.

Supplementing the immediate operating and informational functions of the American Documentation Institute, there are research and development functions contemplated for the future. When facilities permit, investigations are planned upon the application of microphotographic techniques to bibliographical problems, involving selection from microfilm. This is a long-time project requiring much inquiry. There should be a continuing exploration into the methods and materials that enter into documentation, such as photographic methods and techniques, optics, psychological aspects, classifications, etc.

Many of the operations and projects have been described in documents issued for the information of those interested.

The address of the American Documentation Institute is Offices of Science Service, 2101 Constitution Ave., Washington, D. C., while correspondence concerning Bibliofilm Service may be addressed to it, care Library of the U. S. Department of Agriculture, Washington, D. C.

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GEOLOGY

Core Samples of Sea Bottom Sought on Voyage of Atlantis

THE NEXT voyage of the ketch Atlantis of the Woods Hole Oceanographic Institution will take cores from the ocean bottom that should disclose new knowledge of the world's prehistoric weather back to Ice Age days and beyond.

A new and special core-sampling device that is exploded by a charge of 155 m.m. howitzer cannon powder, and drives a core-boring mechanism into the sediment of the ocean bottom will be carried. The core-sampler's inventor, Dr. Charles S. Piggot of the Geophysical Laboratory of the Carnegie Institution of Washington, will be along as guest scientist for the cruise.

The itinerary of the voyage has not been settled definitely but one proposal has been to go from Woods Hole to the Gulf Stream and follow the great ocean current southward to the Virginia Capes. Then the Atlantis would turn westward to the continental shelf off the Atlantic coast and follow it north to Woods Hole, passing the under-ocean canyons that slice through the shelf in this territory.

Dr. Piggot's under water "gun" has already been used in ocean bottom studies in mid-Atlantic. For the coming cruise he has improved his previous mechanisms and will "stand by," as far as possible, to allow other scientists to learn to use the equipment.

The coming voyage will follow the present cruise of the Atlantis on which the ocean's bottom is being investigated in another way. Artificial, tiny vibration waves are now being set up in the mud on the ocean's bottom by exploding charges and the time of transmission of these waves to microphones laid on the floor of the sea is measured.

This technique uses vibration waves that are really artificial, small earthquake shock waves.

The waves start from the point of origin and go through the mud, covering the floor, to the solid rock at the bottom. There, a part of the wave is reflected and detected by the watertight microphones.

The speed of transmission of the waves can be used to disclose, in some detail, the thickness of the muddy bottom.

The experiments on the coming voyage will pierce the mud covering of the ocean floor. It has been found that these deposits contain the remains of prehistoric marine animals, layers disclosing great changes in the earth's climate including the great Ice Age, and also evidences of vast volcanic action at some time in the past, probably in Iceland.

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SAMPLING

Seamen raise the sampling gun that takes cores from the ocean bottom in mid-Atlantic to give scientists the records of a million-year-old past.

PUBLIC HEALTH

Cholera At Its Height As Fighting Fills Peiping

PRESENT fighting in China comes just at the time of the big cholera season, Dr. Victor Heiser, formerly of Rockefeller Foundation and author of "A Doctor's Odyssey," said. Chinese health authorities will probably meet this dangerous situation by widespread vaccination with cholera vaccine. This gives pretty good protection against this ancient plague, Dr. Heiser said.

In spite of the disturbances of the past ten years, China has gone ahead in medical and health activities in an astonishing way. Almost the first money the government gets, Dr. Heiser said, goes for health appropriations. About fifty Western-trained Chinese doctors are improving the health picture in China. A modern research laboratory and hospital at Nanking and a modern laboratory at Shanghai are part of China's health defenses.

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BIOLOGY

Cells Excel Factories In Mass Production Output

A MILLION cigarettes for every person on the face of the earth produced each day would be the output of a cigarette factory if it functioned as efficiently as some of the cells in the body. With cigarette factories one of the best examples of mass production and yet yielding far less than such a hypothetical, staggering output, the remarkable productivity of certain body cells can be realized.

While Dr. Corner did not draw the comparison, it is based on facts developed during a discussion at the biological Symposium at Cold Spring Harbor, L. I., of the report of Dr. G. W. Corner of the University of Rochester concerning the amount of internal secretions produced by the body.

Dr. Corner sought to find a quantitative answer to the question, "How much secretion is produced during a day by a given ductless gland, and how much is present in the body at a given time?"

By experiment, Dr. Corner found that the secretion from one corpus luteum, a follicle which has liberated an egg, is sufficient to maintain pregnancy. He also found that it requires about one three-hundred-fifty-thousandth of an ounce daily of the hormone, progesterone, to do the same thing. Dr. Corner, from this, concluded that this minute amount of hormone was the daily output of a single follicle.

Next the Rochester scientist estimated the number of cells making up the corpus luteum to compute roughly the output of a single cell. Then he calculated the number of molecules of the hormone made by a single cell in a day and came up with the staggering figure of two million billion molecules.

Using the analogy of the cigarette factory, with a molecule equivalent to one cigarette, the factory would have to turn out 1,000,000 cigarettes a day for everyone on earth to equal the cell's output.

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POPULATION

Depression's 'Back to Farm' Movement Now in Reverse

THE end of the depression is now showing up in population figures. For the first time since 1930 the number of farming inhabitants of America has declined in statistics issued by the Department of Agriculture. During last year a net loss of 80,000 people was recorded in the drift toward the cities.

Just as man runs for a storm cellar in a mid-west cyclone so do many city people head back to the land and their scene of birth when the going in life becomes difficult. It has been so in the past and the future may be expected to show the same trend.

From 1910 to the end of the World War in 1918 the drift from farm to city was steady with the War producing a sharp peak because of the plentiful supplies of jobs in urban areas. Then the war-time excess swung back to the farms and until 1921 the country gained in population.

From 1921 to fatal '29 the population pendulum swayed the other way and in 1930 there were fewer people on America's farms than there had been at any time since the World War.

The depression again turned the tide toward a farming population increase and 1932 was the peak. For the last four years, reports the Bureau of Agricultural Economics, the farm population has been essentially stable: varying less than a million persons, loss or gain, in any year except 1932.

The result of all the population swings in the last 27 years is that the farm population today is about one per cent. less than it was in 1910. This seems like but little drift to the cities but the significant point is that the nation's population has increased 40 per cent. in the same period.

Science News Letter, August 14, 1937

IN SCIENCE

GEOGRAPHY

Man Climbs "Devils Tower" Without Scaling Ladders

A FEW live Mormon crickets which cannot fly, some hawks and traces of a small animal, possibly chipmunk, were the only signs of animal life observed on top of Devils Tower, Wyoming, during a recent climb of that natural pinnacle, which reaches 865 feet above the hill from which it springs.

Since the Mormon crickets cannot fly their appearance on the top of the tower, where they were seen walking around, is of particular interest. They apparently are hardy mountaineers, as it is supposed they too made the ascent on foot.

The ascent of Devils Tower by the Alphine Club members was the first successful attempt by humans to scale the great monolith without the aid of ladders or other climbing devices. Fritz Weissner, leader of the party, of New York City; Lawrence Coveney, also of New York; and William P. House of Pittsburgh made the ascent in 4 hours and 48 minutes. They spent forty minutes exploring the top, during which time they met their fellow alpinists, the Mormon crickets, and then made the descent in 1 hour and 32 minutes.

Devils Tower is composed of columnar rock similar to granite, but known as phonolite because of the metallic sound when a thin piece is struck.

Science News Letter, August 14, 1937

ENGINEERING

New "Tree-Form" Columns Permit Clear Aisles

See Front Cover

THE COVER picture of SCIENCE NEWS LETTER in this issue shows the welding of the new type "tree form" columns now being applied in building construction where wide aisles, entirely free from cross members are needed. The graceful, curving columns are being constructed in the shops of the Austin Company at Cleveland, Ohio. They will be used in the new factory of the International Silver Company at Meriden, Conn., where it desired that the factory will be free from shadows and the light uniformly distributed.

Science News Letter, August 14, 1937

NE FIELDS

GEOPHYICS

Powerful Magnetic Storm Most Severe Since April

THE MOST severe magnetic storm disturbance since the magnetic fluctuations of last April, which sent compass needles swinging and disturbed communications, has been reported by the U. S. Coast and Geodetic Survey to Science Service.

Despite the large sunspots in the last few days of July magnetic measurements at the Cheltenham magnetic observatory showed surprisingly little fluctuation. Then, from midnight on August 1 to 5 a. m. Monday, August 2, a magnetic storm arrived which sent instruments askew for five hours.

During the five-hour period the range of oscillations in the declination of the compass changed by 63 minutes, or one degree and three minutes of arc. The range of the value of the horizontal component of the earth's magnetic field varied by 196 gammas. The vertical component of the earth's magnetic field had a range of 259 gammas, the highest since the 400 and 500 values during the April magnetic storm.

"Greatly disturbed" was the language of even the cautious scientists who took the observations.

Science News Letter, August 14, 1937

RADIO—MEDICINE

Short Radio Waves Are New Tools of Medicine

THERE is appeal to the imagination in the fact that very short radio waves can be used as one of the tools of medicine, producing an artificial fever that can be regulated, directed and concentrated.

The struggle and rise of short-wave diathermy to an accepted place in treatment of disease is very recent, for like every new therapeutic measure it underwent its baptism of over-enthusiasm and skepticism. The avidity of the development is shown by approximately 750 articles, books and other publications that have appeared in the last eight years.

As early as 1891 both Nikola Tesla and d'Arsonval showed that a high-frequency electric current produces heat in animals and human beings and they suggest its medical use. Serious and effective application did not arrive until just a few years ago when, thanks to the growth of short-wave radio, apparatus of sufficient power and higher oscillations was produced. Now 10,000,000 (30 meters) to 150,000,000 (2 meters) oscillations are sometimes used.

Intriguing as it is to imagine the radio waves themselves having an effect, Dr. Tibor de Cholnoky of the New York Post-Graduate Medical School, Columbia University, in a book just issued (Columbia University Press) considers short-wave diathermy as purely a form of heat therapy. It is superior, he finds, to other forms of heat therapy because of its deep action.

The principal field of application is to inflammations. The short waves are analgesic and quietening in their effects but the chief beneficial action is by causing an excess of blood in the afflicted areas. The seat of the disease is vitalized and invading organisms are combatted.

In rheumatism, short waves may even eliminate the focus of infection, arrest the disease and restore the function of afflicted portions of the body.

Science News Letter, August 14, 1937

BOTANY

Palm Tree Yielding Wine Reported by Expedition

TROPICAL trees that yield "a red wine comparable with the best vintage wines of France" are reported by Llewelyn Williams, curator of economic botany at the Field Museum of Natural History, who has just returned from a six months' exploring trip into the remote regions of lower Mexico.

The wine tree is a species of palm. The natives cut it down, scoop out a small trough in the trunk, cover it with leaves and let it stand for two days. When they return the hollow is filled with a red wine, termed delicious by Mr. Williams, which is formed by the fermentation of the sap of the tree.

Where wine palms do not exist, or when the thirsty traveler is in too much of a hurry to wait two days, he must slake his thirst by sipping water stored in the stem of the tecolate vine, often six inches in diameter, said Mr. Williams. A three foot section of this stem provides a refreshing but insipid draught.

The botanical expedition of the Museum, led by Mr. Williams, returned with the most complete collection of wood specimens ever obtained from southeastern Mexico.

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POPULATION

Human Resources Going Four Times As Fast As Soil

AMERICA's human resources are disappearing four times as rapidly as her soil resources are being depleted by dust storms, crop removal, and erosion, Dr. O. E. Baker, agricultural economist of the United States Department of Agriculture, told the International Congress on Population.

Famine of agricultural products is not likely to be a danger in the United States, Dr. Baker indicated.

"From the standpoint of agricultural prosperity, we have too much land in the United States and too few people," he declared.

Despite the large losses in soil depletion, amounting to about five per cent. a decade, the rapidly declining birth-rate which has fallen as much as 20 per cent. in the same length of time makes a shortage of food most unlikely, Dr. Baker indicated. If present trends are not greatly altered, the population will increase only about 8,000,000 in the next 20 years by which time the maximum will have been reached.

No increase in arable land will be needed to feed these additional 8,000,000 persons, Dr. Baker estimates.

"In 1930, a year when exports of farm products required the use of about 50,000,000 acres of crop land, when per capita consumption of farm products was fully normal and when the population was only about 6,000,000 less than at present, there were 41,000,000 acres of crop land lying idle or fallow in the United States, and 109,000,000 acres of plowable pasture, and the area of crops harvested the preceding year was nearly 50,000,000 acres greater than in 1936, in part because of the much greater exports.

"The land that requires only plowing to be put into crops exceeds the prospective need threefold.

"Meanwhile, the use of tractors and the substitution of gasoline for horse feed seems very likely to continue. This process has reduced the area of crops needed to feed horses and mules by about 40,000,000 acres during the last 20 years, and if this rate continues this process alone will release land almost as rapidly as it is needed by the increasing population.

"To feed a horse requires as much land as to feed a human being."

Science News Letter, August 14, 1937

PSYCHOLOGY—SOCIOLOGY

How to Find a Husband

A Specialist in Marriage Problems Offers Advice To Intelligent Girls and Tells of Their Handicaps

By MARJORIE VAN DE WATER

"GETTING your man" is a serious business, and girls should treat it seriously. They should give at least as much time and thought to it as they do to careers.

That is the advice of a famous specialist in marriage problems, Dr. Paul Popenoe, general director of the Institute of Family Relations, at Los Angeles, Calif.

Speaking recently at a scientific gathering, Dr. Popenoe offered some very practical hints to the girl, particularly the intelligent college girl, who would like to marry but who does not have proposals from men she would choose for a lifetime partner. Some of his suggestions apply as well to the young man seeking a desirable wife.

First, the young woman must make herself attractive and alluring to the sort of man she considers desirable. Then she must develop her technique for landing him. On both these points, Dr. Popenoe has helpful advice to offer.

An important part of being attractive or marriageable lies in being sexually normal. The most happy marriages are between womenly women and manly men, Dr. Popenoe says. Mannishness, or old-maidishness, to the extent that they are caused by psychological factors, are preventable or curable. Cultivate feminine ways, is Dr. Popenoe's advice.

Must Be Adult

Next, if a girl would be attractive to potential husbands, she must be emotionally grown-up. At the Institute of Family Relations, Dr. Popenoe found that the infantile girl is likely to have a fear of sex, unconsciously perhaps, that prevents her from desiring or attaining a happy marriage, just as a mother fixation is responsible for the celibacy of many old bachelors.

A suspicious or stand-off-ish disposition is a serious handicap in the attempt to become attractive to marrying men.

A college girl must not make the mistake of relying on her diploma to charm desirable potential husbands. When 250 happy, educated married couples were asked what they found most admirable in their respective mates, most of the women stressed intellectual companionability. But the husbands were pleased with something quite different—it was the wife's ability to do her job and be equal to the responsibilities of marriage.

A girl to be attractive as a wife must appeal to the man's emotion, she must be able to enhance his ego, and she must have domestic competence. If she lacks these assets, she can not offset the deficiency by putting forward a quality that he does not particularly want—capacity to satisfy him intellectually.

"An outstanding difficulty of some men in winning a mate is self-centeredness, and their inability or unwillingness to offer that comradeship which the intelligent woman covets," Dr. Popenoe said. "But an outstanding difficulty of some women in winning a mate, is their tendency to try to act like second-class men instead of first-class women.

Should Study Sex

"A realistic study of the psychology of sex, beginning in the high-school period, would prevent the celibacy to which some educated young women are now doomed."

The college girl is really seriously handicapped in the competition for the most desirable husbands, Dr. Popenoe points out. In the first place, her age tells against her. "She will probably not graduate from college before 22; at that age one-half of the native white women of the United States are already married. Each year of delay impairs her chances doubly; first because the available men are diminishing in number by marriage to other girls, and second because the average disparity in age of spouses increases steadily."

Men usually marry younger women; at 25, a man will marry a girl of 22, but at 35 he will marry not one of 32, but one of 28.

"If the college girl takes a job for a few years after graduation, her statistical chances of marriage may vanish," Dr. Popenoe said. "By the time she is ready to wed there are (statistically speaking) no men left to marry her.

"The educated girl who wants to marry successfully should begin to consider the subject seriously from her early college years. She should not confine her "dates" to fellow-students of her own age, but should cultivate the acquaintance of men a few years older than herself, who would be established in their businesses or professions and ready to marry her as soon as she graduates. On graduation, she should make it her first concern to marry, letting a "career" take second place or, if necessary, no place at all."

Want Bright Men

The tendency of girls is to want to marry men superior to them in intelligence while men, on the contrary, prefer girls of inferior intellect. This is hard on the educated, superior girl, for it narrows seriously the group from which she would like to pick her future husband.

"The college girl sometimes has standards that are fantastic and unattainable," Dr. Popenoe said. "But even if she would be content with a man no better than herself, she is still handicapped, for the men of her own level are marrying girls slightly below her level. There are too few men, above her level, to go around.

"Instead of lowering her standard year by year to conform to reality, she sometimes raises it as she becomes more independent economically and culturally. Taken in connection with her own increasing age, this makes inevitably and fatally true her complaint that she never meets any bachelors who are worth marrying."

Occupational segregation of the sexes is another handicap for the educated girl. Meetings resulting from business or professional contacts form one of the main sources of marriage selection, Dr. Popenoe has found. Yet most of the superior girls seem likely to become teachers, librarians, or nurses, and meet only other women as their occupational associates.

"In selecting a career to follow after graduation, girls might sometimes do well to consider more carefully its matrimonial opportunities," Dr. Popenoe advises.

"The irregular geographical distribution of marriageable men further complicates the picture. Some of the northwestern states have two or three times

as many such men per 100 unmarried women, as do some of the southeastern states. Cities are likely to have an excess of unmarried women, farming areas of unmarried men. In some instances, one seeking a mate would do well to move to a more promising locality.

No Chance to Meet

"Even where, in a given area, there are many young men and young women well suited to each other, they may suffer from the lack of social machinery to bring them together. 'Pick-ups' and casual encounters at places of commercial amusement play an important part in the lives of youth of lower socio-economic strata, but not with the educated class. The educational system itself is the most important matrimonial agency for the latter; but if they have not found partners in high school or college, if their occupations do not throw them with possible mates, and if they lack an assured social position in the community based on the contacts of their parents and other relatives in a settled population, they may receive very little help in making those acquaintances which are as necessary for their mental hygiene as for their matrimonial prospects.

"The various dormitories (Y. W. C. A., business girls clubs, and the like) in which girls congregate often make no effective effort to provide a normal social life, and by remaining in them the girl becomes more and more adjusted to a world of one sex, and less and less able to make the acquaintances she desires. Dormitory life for men is even worse. Church young people's societies are often of little help because too small and cliquish.

The Girl Friend

"Too often a girl thus gets into a rut which she never leaves. She forms the habit of going around with some other girl in like case, thus making it all the harder for a man who might like to strike up an acquaintance with her.

"To escape from this wilderness, she must travel alone and study the map.

"She must, in the first place, go where men are, but these must, in the second place, be the right kind of men; and in the third place, conditions must be favorable for acquaintance. It is no use to go to a motion picture, merely because there are men in the audience. Even a cut-in dance is likely to be unprofitable; she may meet a dozen men, but the experience of exchanging commonplaces with them for two or three minutes is not likely to lead to a permanent friendship.

Wider Acquaintance

"The higher one's standards, the wider must be one's range of acquaintance, so that one can live up to these standards. Too frequently, this relationship is reversed. The girl with the highest standards knows the fewest men. Again her 'statistical position' is unfavorable.

"The best way to improve it is to join groups in which young people share some common interest. In every city there are almost countless organizations, public and private, devoted to sport, recreation, religion, art, philosophy, music, literature, science—everything under the sun. One who wants to make acquaintances should canvass all such groups in which he has or can take an interest; visit them one at a time, drop them at once if no 'worthwhile' young people are found, cultivate them further if they promise to be worth cultivation. Such groups are usually anxious to get new members who share their enthusiasms, and the newcomer who travels alone and endeavors to be appreciative will find a hearty reception, whether it be from a club of amateur astronomers or a choral society, a group of hikers or an organization to promote more fluent conversation in Spanish.

Taking two a week, a young man or woman in a large city could visit a hundred such groups in a year. It would be surprising if at least one of them did not repay the effort!

"At the same time, one must develop one's own personality. Many unmarried persons who are otherwise superior have become so self-centered, and so much afraid of themselves and other people, that they cannot bring themselves to seek new acquaintances or to interest those that they do chance to meet. Friends make an effort to introduce them around, only to find that the effort is wasted by non-violent non-cooperation, as Gandhi has it.

Develop Personality

"Such persons would profit by systematic psychological help, if such were accessible; but much can also be done through the excellent popular books on the development of personality, the art of making friends, and related subjects, of which at least a dozen have been published in recent years.

"The shortage of bachelors to serve as potential husbands for the educated and unmarried women is partly offset by the widowers and divorcees who, if they re-

HEAVY HYDROGEN "FACTORY"

Simplified, all-glass apparatus producing a liter of heavy hydrogen every five hours has been developed by Dr. Charles M. Slack, physicist of the Westinghouse Lamp Company. The heavy hydrogen is obtained from heavy water by electrolysis.

marry, usually prefer a maid to an older woman of their own status. Unfortunately the divorcees, who are most plentiful, are to some extent biological inferiors and discards who are worthless matrimonial prospects. Their rate of remarriage is hard to calculate, but it is probable that only a minority of them ever remarry. Those who do remarry represent the more normal and desirable of the group, and the Institute's studies show that their success in a second marriage is not very much less than that of the rest of the population in first-and-only marriages. Divorcees should be scrutinized critically, therefore, but not necessarily rejected, although widowers by death rather than widowers by law, to borrow the terminology of the matrimonial bureau, are probably better 'prospects.'"

Having made herself attractive and marriageable and having sought out the acquaintance of a large number of eligible men to whom she has taken a friendly attitude, the girl should pay strict attention to her "technique." She should be careful to avoid the pitfall of too much aggression in the courtship or proposal, Dr. Popenoe warns.

The role of the female as seductive and alluring rather than aggressive goes back in evolution not only far beyond the human, but far beyond the mammalian stage; it is unlikely that it can be disregarded with safety at the present time.

"One of the common complaints of unhappy husbands is that their wives are too aggressive, of unhappy wives, that their husbands are not aggressive enough," Dr. Popenoe found.

"No law now prevents women from proposing, but every-day observation shows that it is not worthwhile for her to do so.

"The woman who is not clever enough to maneuver a man into a position where he will propose, is probably not clever enough to hold a man after she gets one."

Science News Letter, August 14, 1937

PALEONTOLOGY

Sea Serpent's Skull Found By California Student

A FOSSILIZED skull of a mosasaur —huge serpentine sea-reptile which lived during the upper Cretaceous geologic period, some 60,000,000 years ago, has been found near the town of Gustine, Calif., by Allan Bennison, a sophomore in the University of California. It is the first mosasaur skull to be found west of the Rockies.

The skull is about two feet long, and is six inches in width at its broadest point. It was found embedded in a sandstone formation on the side of a hill, just west of the town. It has been given to the University's museum of paleontology for study.

S. P. Welles, field laboratory assistant in the museum, has informed Science Service that the reptile was about 18 feet long, with a slender, snake-like body. Its limbs resembled paddles with which it propelled its way through the water. Its tail was somewhat fan-like in shape, and served as a scull to guide its passage. In appearance, Mr. Welles said, it was a "cross between the present day sea-lion and sea-snake."

Its habitat was the ocean. But like the whale, it had to come to the surface for air. It had large, sharp teeth and probably was a fish eater.

Paleontologists at the university are planning an expedition to the region in which the find was made, in the hope of recovering the remainder of the skeleton. It is believed this will necessitate tunneling into the side of the hill, as the skull itself was found on a steep slope.

Some two years ago, Mr. Bennison found a dinosaur in the same region, and this discovery led him to make a careful survey of the area, with the result that he uncovered his present find.

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The Romans got their first taste of food made from rye and oats when they encountered northern Europeans.

ASTRONOMY

Supposed "Ghost" Comet Claimed To Be Real

WHEN reports were received in April of the discovery of a new comet in the southern skies by W. F. Gale, an Australian astronomer, and great observatories in Europe and America were unable to locate it, the assumption was made that it was a "ghost." It was near the brilliant planet Mars, and often reflections from such a bright object, inside the eyepiece of a telescope, cause these ghosts, which look like comets.

The comet was real after all, according to a claim in a letter from Mr. Gale to Dr. A. C. D. Crommelin, published in the *Journal of the British Astronomical Association*. Mr. Gale states that he fully recognized the liklihood of its being a ghost, and made careful tests to determine its reality. The telescope, he says, never showed such ghosts before, and the comet was seen best when Mars was completely out of the field. It was observed by several others, and through other telescopes, over a period of nearly a month, during which it moved as a comet should.

As he found the comet to vary considerably in brightness, it may be that it happened to be very faint when the northern observers looked for it. Also, it was much better placed for viewing in Australia, for there it was nearly overhead, while in Europe and North America it was low in the south. After the word was circulated that it could not be found, and northern astronomers decided that it was a ghost, no further search was made.

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ANTHROPOLOGY

Man Himself is Feature Of New Style World's Fair

IMPOSSIBLE as it may seem, a new style in world's fairs and expositions is being set. Industrial, territorial and colonial expansion and, more recently, scientific achievements have dominated world's fairs in the past. When the New York World's Fair opens in 1939 the new style, with emphasis on man himself, will come to full flower.

The general theme of this fair will be "Man and the World of Tomorrow." But if man is to dominate the fair generally, he will reign supreme in the building which will house exhibits displaying the latest scientific knowledge of medicine and public health.

"Man wanders over the restless sea, the flowing water, the sight of the sky and forgets that of all wonders man himself is the most wonderful," St. Augustine wrote years ago. That saying has been taken for the theme of the Hall of Man, one of three halls in the building which may be called "A World of Health."

All the exhibits in this building will be dramatic presentations of these wonders and of current knowledge for keeping the body healthy.

Chief of the wonders of man himself is his brain, without which there could have been no advances in medicine and health, in fact, no fair at all. This wonder will be shown in a particularly striking exhibit.

Built something like a planetarium, it will be a huge model of the inside of a man's head. World's Fair visitors may walk into this and stroll over the teeth and down the passageways for food and breath. They will learn from the inside out the geography of the human brain. A guide will help them locate the nerve centers for sight, sound and smell; the body's master gland; and all the other intricate structures locked up in the close compartment of the human skull.

Science News Letter, August 14, 1937

POPULATION

Population Problems Call For a Government Policy

Expert Urges Study of Increasing Labor Groups, Differences in Birthrates, Old Age Problems

CONSIDERATION of human resources as well as physical and economic factors in forming government policies in the United States was urged by Dr. T. J. Woofter, Jr., coordinator of rural research for the Works Progress Administration, at the International Population Congress.

Dr. Woofter called attention specifically to some of the human elements that press for attention on the part of those guiding the nation's destiny:

1. Number of young job-seekers. Although births are declining in the United States, the number of those reaching employment age has not yet begun to decline. During the early 1930's, the United States was adding to her labor market almost as fast, probably, as it ever will. Six million young men and women entered the ranks of those seeking employment between 1930 and 1936, at just the time when industry was least able to absorb them. The rate of those reaching 18 years will continue to increase up to about 1942 and then decline rather rapidly after that.

2. Difference between city and country birthrates. Children, like agricultural crops, grow better in the country. For a number of years, the rural regions have been helping the cities to maintain their numbers, for birthrates in the city are too low for replacement of one generation by the next.

3. Difference in birthrates for prosperous and poor. In country and city alike, the poor people are those who have the large families. In the past this has caused a "population pressure" and a natural movement of people from farms that are not fertile to better lands and to the cities.

4. The trek to the cities. Although cities did not have enough births to replace those removed by death, increase in city population between 1910 and 1930 amounted to 27,000,000 although the increase in rural population was only 4,000,000. These figures tell of an enormous movement from farm to city.

5. Decrease in farm to city movement. The depression put a stop to this natural movement. Boys and girls out of a job went back home for shelter. This meant a movement back to the farm, and, since the less prosperous farms have the most children, it meant a movement back to the poorest land.

Steps have been taken by the Government to meet these problems, Dr. Woofter pointed out. Such are the programs to aid maturing youth—CCC, transient work camps, Youth Administration employment projects. But these affect practically only those whose families are on relief.

The Resettlement Administration has made a beginning in the direction of a planned distribution of the population. Old age pension legislation is an attempt to meet the problem of increase in the proportion of old people, whose numbers will increase from 6,600,000 in 1930 to 14,200,000 in 1960.

●RADIO

August 17, 4:15 p. m., E.S.T.

WONDERS OF THE HEAVENS—Dr. F. R. Moulton, noted astronomer.

August 24, 4:15 p. m., E.S.T.

ADOPTED CHILDREN—Dr. Mandel Sherman, psychologist of the University of Chicago.

In the Science Service series of radio discussions over the Columbia Broadcasting System.

The policy of crop control, on the contrary, ignored the population problem, Dr. Woofter said. Restricting crops results in less opportunity for those seeking farm employment.

"The first step in population planning in the United States seems to call for facing the issue of quality versus quantity and a decision as to which of the policies is to be paramount," Dr. Woofter concluded. "Neither in increase in quantity, improvement of quality, nor nationalization of distribution does the national Government have a clear-cut policy.

"This is not owing to neglect of a clearly recognized need. It is rather owing to the fact that without further research, exact and detailed knowledge in each of these fields is insufficient to form the basis of intelligent planning."

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CHEMISTRY

Industrial Plants Loose CO_2 But Green Plants Return It

No Danger Exists That Earth's Crust Will Change Or That Atmosphere Will Contain Too Much of Gas

EVEN though man has released into the atmosphere some 180,000,000,000 tons of carbon dioxide gas by the burning of mined fuel during the last half century, the plants of the world each year return this carbon dioxide a thousand fold through their decay or combustion.

Dr. Robert E. Wilson, president of the Pan American Petroleum and Transport Company, who reports this result (*Industrial and Engineering Chemistry*) also notes that the fears of those people who shudder at the "greatly" increased carbon dioxide content of the air which is produced by modern industrial activity, are unfounded.

If all the carbon dioxide dumped into the atmosphere in the last 50 years had not been removed by returning the elements involved to the earth in some form or other, says Dr. Wilson, the carbon dioxide content of the atmosphere would have increased only two-thousandths of one per cent. in that time; from 0.03 to 0.032 per cent.

The controlling factor which determines how much carbon dioxide there is in the air, reports Dr. Wilson, is the water of the earth's oceans. Available data indicate there is some 30 to 40 times as much carbon dioxide dissolved in the ocean as is present in the atmosphere.

"The average partial vapor pressure of this carbon dioxide," says Dr. Wilson, "is probably largely what determines the average carbon dioxide content of the air, so that well over 90 per cent. of any excess carbon dioxide introduced into the atmosphere eventually finds its way into the ocean, leaving the composition of the former virtually unaffected."

The chemist, points out Dr. Wilson, sometimes needs to be reminded that all his advances are really puny efforts when placed beside changes needed to make sizable alterations in the state of the earth.

"The combined result of all our mining and chemical activity to date has made but an infinitesimal alteration in the composition of the earth's crust or sea water," he declares. And this, despite the fact that in the past half century some 50,000,000,000 tons of carbon have been obtained as either coal, lignite, crude petroleum or natural gas.

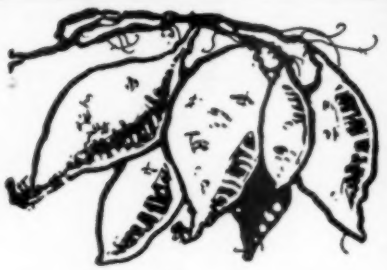
There is no fear, concludes the petroleum scientist, that chemistry and industry are, in some way, working an atmospheric transformation that might threaten human existence.

Science News Letter, August 14, 1937

English clover would grow in Australia, but produced no seed until bees from Great Britain were brought there for cross-fertilization purposes.

AGRICULTURE

NATURE RAMBLINGS by Frank Thone



Paleolithic Planters?

DID FARMING have its earliest beginnings in the Old Stone Age?

Prof. Oswald Menghin of the University of Vienna, thinks it possible. If he is correct in his conjecture, farming becomes a vastly older way of life than has usually been supposed.

There is no doubt, of course, that agriculture was widespread and well developed in the New Stone Age, whose beginnings were something like 20,000 years ago. Abundant archaeological evidence shows that men grew grain and kept herds in the Neolithic of Egypt, of Mesopotamia, of India, of China. We do not know the age in years of the pre-Columbian corn-pumpkin-tobacco agriculture in America, but there can be no question that it also arose in a Neolithic culture stage.

The common assumption has gone beyond this, and credited the Neolithic peoples with the actual invention of agriculture. To the Paleolithic, or Old Stone Age, peoples is assigned merely the role of hunter, fisher, and grubber-up of wild-growing roots.

Prof. Menghin points out that in the Old Stone Age, which almost certainly runs back 200,000 years and possibly much more, the distribution of one particular type of stone blade, well adapted for turning the soil, coincides with the general distribution-zone of plants with thick, edible roots and tubers.

This kind of blade is usually called a "hand-ax", but it was adapted to other uses than chopping wood. It could also be held in both hands as a kind of crude hoe or trowel, and so serve well as a grubbing tool.

Conjectures on the Neolithic origin of agriculture usually picture men of the New Stone Age as gathering wild grains and other food plants, and then discov-

ering accidentally that they could be sown. Prof. Menghin carries the same mode of reasoning back to his Old Stone Age root-grubbers. If Neolithiker could spill barley grains and see them grow, why should not Paleolithiker lose a few parsnips and later find them sprouting?

Science News Letter, August 14, 1937

ARCHAEOLOGY

Evidence of Human Artifacts Points To Earliest Existence

By E. N. FALLAIZE
Royal Anthropological Institute of London

THE EARLIEST known traces of man's existence in Palestine, and it may be, almost the earliest evidence of man in the whole world, have been discovered in deposits now known as the Bone Beds of Bethlehem.

The discovery was made by Miss E. Gardiner and Miss D. Bate excavating the deposits, in what appears to be a swallow hole near Bethlehem, on behalf of the Wellcome Marston Archaeological Research Expedition to the Near East.

The discovery of the swallow hole was made some few years ago when excavations were being made for a water supply. On the nature of the deposits becoming apparent, a concession to excavate was granted to J. L. Starkey on behalf of the Wellcome Expedition. The actual examination of the deposits was entrusted to Miss Bate, the well known authority of the British Museum of Natural History on paleontology, and Miss E. Gardiner, Lecturer on Geology of London University.

Two short seasons' work had produced some interesting and scientifically valuable paleontological specimens, but it was not until the season of 1937 that indubitable evidence of man's handiwork was forthcoming. Specimens of the animal remains and worked flints which were associated with them from these deposits are now on exhibition at the Wellcome Research Institution, London.

The most striking specimen among the animal remains is the hinder part of the shell of a gigantic tortoise of a species not yet identified. With it were several detached plates of the shell and a huge leg bone. Although only the tail part of the shell was found whole, it measures well over two feet across, as compared with a little over two inches for the same part in a tortoise of about a foot in diameter. There is also part of the tooth of an elephant—the elephant was first identified in Palestine in evidence from the Bethlehem bone beds—and cheek teeth of the rhinoceros. Most important, however, from the view of the paleontologist and geologist is what appears to be a part of a leg bone of a very small form of horse, possibly hipparion, the three-toed horse of the Tertiary geological epoch.

In the same beds, and associated with these remains, were a number of worked flints of which a selection has been brought to England and is now available for examination by expert judges of man's earliest handiwork. There can, however, hardly be any doubt as to the human origin of these specimens. One of them appears to be a core, from which flakes have been struck, while the others show the characteristic forms and chipping found in eolithic or pre-palaeolithic implements. Of those who have seen them, J. Reid Moir, the great authority in Great Britain on pre-palaeolithic implements, is confident as to their human origin and their early form.

As regards their dating, until the base of the deposits at the bottom of the swallow hole has been reached, it will be impossible to speak with absolute certainty as to their origin, though even now there can be little doubt as to their great age. The species of the specimens found has not yet been determined, and until that has been done, it will not be possible to assign an exact dating in geological terms. There is every reason to say that at least the deposits are not later than Early Pleistocene, and it may be that they are Pliocene. This is certainly nearly as early as the earliest date assigned to the earliest implements found by Reid Moir in England, and approximately contemporary with Peking Man and Pithecanthropus, unless a Pliocene dating is proved, when it is earlier. For this half a million years might be regarded as a very moderate estimate.

Science News Letter, August 14, 1937

AVIATION

New Airplane De-Icers Approved By Air Commerce

THE new type airplane de-icing mechanism which substantially reduces the danger of rips has been approved by the U. S. Bureau of Air Commerce.

The device is an improvement on the well-known rubber "overshoes" on the leading edge of airplane wings and tail surfaces. These overshoes could be expanded and contracted by compressed air, breaking up ice formation so that the wind whistling over the wings could blow it away.

One trouble was that if a small hole developed in these rubber de-icers it might become enlarged and soon render the whole mechanism ineffective. The new improvement uses fabric reinforcing strips in the rubber covering which prevent rips from spreading beyond the limits set by the strip. Thus, small holes can become no larger and partial operation, at least, of the de-icer will be possible.

The B. F. Goodrich Rubber Company developed the de-icers in collaboration with the following government agencies: Bureau of Air Commerce, National Advisory Committee for Aeronautics, United States Army Air Corps, Naval Air Service. Cooperation with the commercial airlines was also employed.

Science News Letter, August 14, 1937

One-half of the shade trees of New England are elms.

First Glances at New Books

Physics

PHYSICS IN INDUSTRY—Karl T. Compton and others—*American Institute of Physics*, 290 p., $1.50. In this little volume are collected the major addresses which were presented in October, 1936, at the fifth anniversary of the founding of the American Institute of Physics. Physics is often neglected in a brief and hurried study of modern industries, but some of the ramifications of this "mother" science of the engineering profession are herein described.

Science News Letter, August 14, 1937

Mountaineering

THE ASCENT OF NANDA DEVI—H. W. Tilman—*Cambridge (Macmillan)*, 235 p. illus., $3.50. Nanda Devi is the highest mountain that has yet been climbed to the top—besides being one of the most beautiful in the Himalayas. Mr. Tilman was one of the two members of the party who reached the summit.

Science News Letter, August 14, 1937

Sociology

PROCEEDINGS, TWENTY-SECOND NATIONAL RECREATION CONGRESS. GENERAL THEME: THE IMPORTANCE OF RECREATION IN MODERN LIFE—*National Recreation Association*, 151 p., $1.

Science News Letter, August 14, 1937

Physics

A TEXTBOOK OF PHYSICS (5th ed.)—Louis Bevier Spinney—*Macmillan*, 721 p., $3.75. Fortunately the good things in science go on and on and Prof. Spinney's widely used textbook now goes into a new edition. Obsolete material has been dropped and new topics introduced. More than fifty new figures have been added. Brief mention is made of induced radioactivity and the atom-smashing devices used in the modern studies of nuclear physics.

Science News Letter, August 14, 1937

Physics

DISSOCATION DE L'EAU EN H^2 ET OH—*H. Hering—Paris, Hermann & Cie*, 24 p., 10 fr.

Science News Letter, August 14, 1937

Physics

ORIGINS OF CLERK MAXWELL'S ELECTRIC IDEAS, AS DESCRIBED IN FAMILIAR LETTERS TO WILLIAM THOMSON—Sir Joseph Larmor, ed.—*Cambridge (Macmillan)*, 56 p., $1. Behind the abbreviated, symbolized equations of physics there are often romantic stories and historical events. The present volume concerns a series of letters which Clerk Maxwell wrote to his friend, William Thomson, during the period when he was groping towards a structural theory of the electric and magnetic field; a theory which put into mathematical form the significant researches of Michael Faraday.

Science News Letter, August 14, 1937

Physics

MECHANICS—William Fogg Osgood—*Macmillan*, 495 p., $5. Harvard's emeritus professor of mathematics gathers together in this text-book the basic principles of mechanics as he has taught them in more than forty years of university education. Prof. Osgood's texts have always been noted for the ingenuity and cleverness of their problems and the current work is no exception to this long established rule.

Science News Letter, August 14, 1937

Mathematics

THE NEW APPLIED MATHEMATICS (rev. ed.)—Sidney J. Lasley and Myrtle F. Mudd—*Prentice-Hall*, 544 p., illus., $1.60. The third edition of this high school text, whose authors are on the staff of the Northeast Junior High School of Kansas City, Mo. A chapter on "brain teasers" near the end of the book will furnish enjoyment.

Science News Letter, August 14, 1937

Physics

SCIENCE EXPERIENCES WITH HOME EQUIPMENT—Carleton John Lynde—*International Textbook Co.*, 226 p., illus., $1.25. The ingenious and interesting science experiments that can be performed in your own home. Dr. Lynde is associated with Columbia University Teachers College in New York City.

Science News Letter, August 14, 1937

Physics

ELASTICTIY, PLASTICITY AND STRUCTURE OF MATTER—R. Houwink—*Cambridge (Macmillan)*, 376 p., $6. An English translation of the comprehensive book by a physicist at the famed Philips Glowlamp Works, Eindhoven, Holland; with a chapter on the plasticity of crystals by W. G. Burgers.

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Medicine

SHORT-WAVE DIATHERMY—Tibor de Cholnoky—*Columbia Univ.*, 310 p., $4.

See page 105.

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Physics

SOUND WAVES: THEIR SHAPE AND SPEED—Dayton Clarence Miller—*Macmillan*, 164 p., illus., $2.75. Back in 1900 Prof. Miller set out to try to find the answer to the question of possible changes in the quality of a musical instrument—the flute—when the tube was made from gold or silver or wood. In the intervening years he has studied widely in the field of acoustics and in this book makes his researches available to his fellow scientists.

Science News Letter, August 14, 1937

Education—Psychology

READING INTERESTS, ACTIVITIES, AND OPPORTUNITIES OF BRIGHT, AVERAGE AND DULL CHILDREN—May Lazar—*Teachers College, Columbia Univ.*, 127 p., $1.60. Mystery stories are favorites. Boys like magazines better than do girls. In the newspaper, the comic section is the most popular; more serious parts are read by the bright children and the "rotogravure" section by the dull. The number of books in the home is some indication of the intelligence of the child. These are among the interesting facts included in this report which should interest parents as well as teachers and librarians.

Science News Letter, August 14, 1937

Psychology

THE ENJOYMENT OF LAUGHTER—Max Eastman—*Simon and Schuster*, 367 p., $3.50. In formulating his theories of laughter, Max Eastman studied the infant crowing as he is tossed up and caught again. He also sat at the feet of the masters of art of making others laugh—Charlie Chaplin, Will Rogers, Groucho Marx, W. C. Fields, and others like them.

Science News Letter, August 14, 1937

Juvenile Delinquency

DYNAMIC CAUSES OF JUVENILE CRIME—Nathaniel D. M. Hirsch—*Sci-Art*, 250 p., $3.25. A former director of the Wayne County Clinic for Juvenile Delinquency undertakes to go behind the case records and analyze the causes of crime among the youth.

Science News Letter, August 14, 1937

Child Hygiene

FEEDING BEHAVIOR OF INFANTS—Arnold Gesell and Frances L. Ilg.—*Lippincott*, 201 p., illus., $4.50. Beautiful photographs add great charm to this scientific study of infant behavior.

Science News Letter, August 14, 1937